



**APPENDIX AVAILABLE ON
THE HEALTH EFFECTS INSTITUTE–ENERGY WEBSITE**

Communication 1

**HUMAN EXPOSURE TO UNCONVENTIONAL OIL AND
GAS DEVELOPMENT:
A LITERATURE SURVEY FOR RESEARCH PLANNING**

HEI-Energy Research Committee

Appendix D. Biographies of Energy Research Committee Members

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APPENDIX D

Biographies of the Energy Research Committee Members

George M. Hornberger (Chair)

Dr. Hornberger is a University Distinguished Professor at Vanderbilt University, where he directs the Vanderbilt Institute for Energy and Environment and has a shared appointment as the Craig E. Philip Professor of Engineering and as Professor of Earth and Environmental Sciences. Previously he was a professor for many years at the University of Virginia where he held the Ernest H. Ern Chair of Environmental Sciences. He has been a visiting scholar at the Australian National University, Lancaster University, Stanford University, the United States Geological Survey, the University of Colorado, and the University of California at Berkeley. Dr. Hornberger's research centers on the coupling of field observations with mathematical modelling. Recognizing that water resources are under pressure from many human activities from climate change to urban development, he pursues broadly interdisciplinary research focused on coupled natural-human systems. The goal of the research is to understand how climate, groundwater, surface water, and human abstraction of water interact in complex ways. Current projects include work in Sri Lanka on adaptation to drought and in the United States on how cities evolve water conservation practices. He has published extensively, with numerous scientific papers, book chapters, and books.

Dr. Hornberger has served on numerous boards and committees of the National Academies, most recently as chair of the Committee on "Future Water Resource Needs for the Nation: Water Science and Research at the U.S. Geological Survey" and chair of the Water Science and Technology Board. He has also served other organizations, for example, he chairs the Geosciences Policy Committee of the American Geosciences Institute and serves on various committees of the Geological Society of America, the American Geophysical Union, and other organizations. In 2015, he recently completed service as the chair of the Health Effects Institute Special Scientific Committee on Unconventional Oil and Gas Development. Before that in 2013, he chaired a related National Research Council Committee on Development of Unconventional Hydrocarbon Resources in the Appalachian Basin. He previously served as an editor on several highly regarded journals. Dr. Hornberger won the Robert E. Horton Award (Hydrology Section) from the American Geophysical Union in 1993. In 1995, he received the John Wesley Powell Award from the U.S. Geological Survey. In 1999, he was presented with the Excellence in Geophysical Education Award by the American Geophysical Union and in 2007 he was selected Virginia Outstanding Scientist. Professor Hornberger was elected to the U.S. National Academy of Engineering in 1996. He was also elected a Fellow of the American Geophysical Union in 1994, the Association for Women in Science in 1996, and the Geological Society of America in 2005, received the William Kaula Award from the American Geophysical Union in 2010, and the Harvie Branscomb Distinguished Professor Award from Vanderbilt University in 2017.

Dr. Hornberger holds a B.S.C.E. in Civil Engineering and an M.S.C.E. in Hydrology from Drexel University and a Ph.D. in Hydrology from Stanford University.

Shari Dunn-Norman

Dr. Dunn-Norman is Associate Professor and the former Program Head of Petroleum Engineering at the Missouri University of Science and Technology. Previously, she worked in both domestic and international assignments for the Atlantic Richfield Companies (ARCO), beginning her career as a summer field roustabout and advancing to Senior Operations Engineer at ARCO International. Dr. Dunn-Norman's research has focused on pipeline flow and leak detection, well construction for the protection of underground sources of drinking water, hydraulic fracturing, and well completions. She has over 25 years of combined academic, industrial, and consulting experience in well design and well completion technology. She has published extensively, with numerous scientific papers and book chapters and co-authored a book on well construction.

Dr. Dunn-Norman is a member of the Society of Petroleum Engineers, where she has served on numerous committees. She was elected and currently serves as the National President of Pi Epsilon Tau, the Petroleum Engineering Honor Society. She is also a member and volunteer for the St. Louis Academy of Science and the Missouri Academy of Science. Dr. Dunn-Norman served on the U.S. Environmental Protection Agency Science Advisory Board 2011 Ad Hoc Hydraulic Fracturing Research Advisory Panel, which reviewed EPA's draft "Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources." For more than 20 years, Dr. Dunn-Norman has taught numerous industrial short courses about production engineering and well completions for various companies, such as Petroleum ETC, a private corporation that operates events worldwide on topics ranging from multiphase pumping and artificial lift, to hydraulic fracturing; and Petroskills, a leading world organization in all areas of oil and gas training. Dr. Dunn-Norman has received numerous awards, most recently the Society for Professional Engineers' Distinguished Member Award in 2015 and several excellence in teaching awards.

Dr. Dunn-Norman holds a B.S. in Petroleum Engineering from the University of Tulsa and a Ph.D. in Petroleum Engineering from Heriot-Watt University, Edinburgh, Scotland.

Stefanie Ebelt

Dr. Ebelt is Associate Professor of Environmental Health at the Rollins School of Public Health of Emory University. Her epidemiological research focuses on examining health effects of ambient air quality using population- and panel-based approaches. She leads large-scale time-series studies of ambient air quality and acute morbidity, using emergency department visit data as an indicator of population health. Dr. Ebelt's work on these studies focuses on assessment of ambient air pollution mixtures and metrics of extreme heat, examination of the impacts of exposure measurement error on observed epidemiological findings, and assessing exposure and population factors that may modify health risk. Her studies also include prospective panel-based designs, using detailed field investigation methods to further understand environmental exposure factors and health effects among susceptible and vulnerable populations. She has published extensively in the peer-reviewed literature and has frequently been asked to speak on exposure and epidemiological topics.

Dr. Ebelt is a member of the International Society for Environmental Epidemiology, an editorial board member at *Epidemiology*, and an associate editor at the *Journal of Exposure Science and Environmental Epidemiology*. Dr. Ebelt participated on the National Research Council's Committee on Urban Meteorology: Scoping the Problem, Defining the Need and the Health Effects Institute's Review Panel on Ultrafine Particles. She has participated as an expert reviewer of drafts of the U.S. Environmental Protection Agency Integrated Science Assessments for particulate matter and nitrogen oxides. She serves as the Point of Contact for Emory University as an observer organization in the United Nations Framework Convention on Climate Change process. Dr. Ebelt has been honored with several awards, most recently the Department of Environmental Health Teaching Award at Emory University and a Supporting Paper for a Level III U.S. Environmental Protection Agency Scientific and Technological Achievement Award.

Dr. Ebelt holds a B.Sc. in Microbiology and Immunology and a M.Sc. in Occupational Hygiene from the University of British Columbia and a Sc.D. in Environmental Health from the Harvard School of Public Health.

Elaine M. Faustman

Resigned from the Committee on November 27, 2018

Elaine M. Faustman is Professor in the Department of Environmental and Occupational Health Sciences and Director of the Institute for Risk Analysis and Risk Communication in the School of Public Health and Community Medicine at the University of Washington. Dr. Faustman's research includes quantitative risk assessment for non-cancer endpoints, molecular mechanisms of developmental and reproductive toxicity, and in vitro and molecular biological methodologies. She develops decision-analytic tools for communicating and translating new scientific findings into risk assessment and risk management decisions. Dr. Faustman directs the National Institute of Environmental Health Sciences /Environmental Protection Agency-funded Center for Children's Health Research. She has served as Principal Investigator for the Pacific Northwest Center for the National Children's Study and has directed the Pacific Northwest Center for Human Health and Ocean Studies. The goals of Dr. Faustman's research are to discover the mechanisms that define susceptibility in at-risk populations and to provide linkages across disciplines. She has over 200 peer-reviewed research publications and reports.

Dr. Faustman is an elected fellow of the American Association for the Advancement of Science and the Society for Risk Analysis. She has served on the U.S. Environmental Protection Agency Science Advisory Board. She previously chaired the National Academy of Sciences Committee on Developmental Toxicology and served as a member for the National Advisory Environmental Health Sciences Council, the National Institute of Environmental Health Sciences-National Toxicology Program Committee on Alternative Toxicology Methods, the National Institute of Environmental Health Sciences -National Toxicology Program Board of Scientific Counselors, the National Academy of Sciences Committee on Toxicology, and the Institute of Medicine Upper Reference Levels Subcommittee of the Food and Nutrition Board. She has just completed two terms as Secretary General for the International Union of Toxicology. She is currently a member of the International Science Council World Data Systems Advisory Board. She served on the U.S. Environmental Protection Agency Science Advisory Board 2011 Ad Hoc Hydraulic Fracturing Research Advisory Panel, which reviewed Environmental Protection Agency's draft Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources. Dr. Faustman also served on the executive boards of the Society of Toxicology, the Teratology Society, and the Society for Risk Analysis. She has served as an editor on several highly regarded journals. Dr. Faustman has been honored with numerous awards, most recently the 2016 Josef Warkany Lecturer Award from the Teratology Society, the Distinguished Achievement Award from the Society for Risk Analysis in 2014, and the University of Washington's Outstanding Teaching Award.

Dr. Faustman holds an A.B. in Chemistry and Zoology from Hope College and a Ph.D. in Pharmacology/Toxicology from Michigan State University.

Howard Hu

Howard Hu is Affiliate Professor in the Department of Environmental and Occupational Health Sciences, the University of Washington School of Public Health, as well as Adjunct Professor in the Department of Environmental Health Sciences, University of Michigan School of Public Health. Until recently, he was the founding Dean and Professor of Environmental Health, Epidemiology, and Global Health at the Dalla Lana School of Public Health at the University of Toronto (2012–2018). Previously, Dr. Hu was Professor of Occupational and Environmental Medicine at the Harvard School of Public Health and Associate Physician in the Channing Laboratory of the Brigham and Women’s Hospital in Boston, Massachusetts (1990–2006), after which he was the National Science Foundation International Endowed Chair of the Department of Environmental Health Sciences and Professor of Environmental Health, Epidemiology and Internal Medicine at the University of Michigan School of Public Health and Health System (2006–2012). Dr. Hu is a physician-scientist, trained as an internist, occupational and environmental medicine specialist, and epidemiologist. He founded an environmental epidemiology research group that, since 1990, has grown into a multi-institutional and international team of scientists devoted to gaining new insights into the impact of exposure to potential toxicants that are of critical importance to public health and medicine. His environmental and molecular epidemiologic research has focused on heavy metals, potential endocrine disruptors, other neurotoxicants, and carcinogens, with particular interest in exposures during sensitive life stages. Dr. Hu has published more than 300 original papers in the scientific literature, and co-authored and edited several books.

He has served on the Institute of Medicine’s Board of Population Health and Public Health Practice, the Board of Environmental Science and Toxicology of the National Research Council, and on the National Advisory Environmental Health Sciences Council for the National Institutes for Health. In 2016, he was elected to Fellowship, Canadian Academy of Health Sciences. He also served as the founding medical editor of *Environmental Health Perspectives*, the official journal of the National Institute of Environmental Health Sciences. He currently serves on the Board of Directors of the Canadian Urban Environmental Health Research Consortium. Dr. Hu has received numerous awards, including most recently the Linus Pauling Lifetime Achievement Award, the Award of Excellence from the American Public Health Association, and the John R. Goldsmith Award for Outstanding Contributions to Environmental Epidemiology from the International Society for Environmental Epidemiology.

Dr. Hu holds a B.Sc. in Biology from Brown University, an M.D. from the Albert Einstein College of Medicine, and an M.P.H. and Sc.D. in epidemiology from the Harvard School of Public Health. He trained in internal medicine at Boston City Hospital and in occupational and environmental medicine at Harvard.

Judy S. LaKind

Dr. LaKind is President of LaKind Associates, LLC, an Adjunct Associate Professor in the Department of Epidemiology and Public Health at the University of Maryland School of Medicine, and a Fellow-by-Courtesy in the Department of Applied Mathematics and Statistics at The Johns Hopkins University. Dr. LaKind has taught graduate level courses at The Johns Hopkins University and the University of Maryland in risk assessment and aquatic chemistry. Previously, Dr. LaKind was a geologist at the U.S. Environmental Protection Agency's Office of Federal Activities, where she was responsible for the evaluation of environmental impact statements and legislative reports. She is a health and environmental scientist with expertise in exposure science, assessment of human health risks, biomonitoring, scientific and technical analysis for regulatory support, and state-of-the-science reviews. Dr. LaKind has spoken and published extensively on children's exposures to environmental chemicals, the implications of uncertainty in the risk assessment process, weighing potential risks and benefits related to chemical use, the presence of environmental chemicals in human milk, and time-dependence and distributional analysis of exposure.

Dr. LaKind is Past President of the International Society of Exposure Science. She is a member of the NIH Working Group – Risk Of Bias In Non-randomized Studies of Exposures, the HESI RISK21 Advisory Board, and the Maryland Department of Health and Mental Hygiene Cancer Cluster Advisory Committee. Dr. LaKind also served on the World Health Organization Survey Coordinating Committee for the World Health Organization Global Survey of Human Milk for Persistent Organic Pollutants (POPs), the Institute of Medicine Committee on Blue Water Navy Vietnam Veterans and Agent Orange Exposure, the U.S. Environmental Protection Agency Science Advisory Board Panel on Perchlorate — Approaches for Deriving Maximum Contaminant Level Goals for Drinking Water, Maryland's Children's Environmental Health and Protection Advisory Council, the Maryland Lead Poisoning Prevention Commission, and the Maryland Pesticide Reporting and Information Workgroup. Dr. LaKind has received awards, including the 2017 Society of Toxicology Regulatory and Safety Evaluation Specialty Section Award for Best Paper Contributing to the Field of Regulatory and Safety Evaluation in Toxicology and the 2015 Environment Protection Agency Scientific and Technological Achievement Award Level III for "Providing Critical Models and Information Needed for Exposure and Risk Assessments of Environmental Chemicals in Infants." She serves on the editorial boards of the Journal of Toxicology and Environmental Health and Environment International.

Dr. LaKind holds a B.A. in Earth and Planetary Sciences from Johns Hopkins University, an M.S. in Geology from the University of Wisconsin, and a Ph.D. in Geography and Environmental Engineering from Johns Hopkins University.

Armistead (Ted) G. Russell

Dr. Russell is the Howard T. Tellepsen Chair and Regents' Professor at the Georgia Institute of Technology School of Civil and Environmental Engineering. Dr. Russell's research is aimed at better understanding the dynamics of air pollutants at urban and regional scales and assessing their impacts on health and the environment to develop approaches to design strategies to effectively improve air quality. He currently co-directs the National Science Foundation Sustainability Research Network "Environmentally Sustainable, Healthy and Livable Cities" project and co-directed the Southeast Center for Air Pollution and Epidemiology. His research interests include air pollution modeling, aerosol dynamics, atmospheric chemistry, and combustion emissions control. He has published over 300 peer-reviewed journal articles, book chapters, and major reports.

Dr. Russell is a Fellow of the American Society of Mechanical Engineering and the American Association for the Advancement of Science and is a National Associate of the National Academies. Dr. Russell was a member of Environmental Protection Agency's Clean Air Science Advisory Committee (CASAC) and a member of the National Research Council's Board on Environmental Studies and Toxicology, and he continues to serve on associated committees. He chaired the CASAC NO_x-SO_x, Secondary NAAQS review panel, the Ambient Air Monitoring Methods Subcommittee, and the Council on Clean Air Compliance Analysis' Air Quality Modeling Subcommittee, and was on the Health Effects Institute's Report Review Committee. Dr. Russell has been honored with numerous awards, including the 2015 Distinguished Alumni Award from Washington State University, the 2013 Regents' Professor Award, and he was the Most Influential Individual to 2013 semifinalist for the Intel Science Talent Search.

Dr. Russell holds a B.S. in Mechanical Engineering from Washington State University, and an M.S. and Ph.D. in Mechanical Engineering from the California Institute of Technology. He conducts his research at Caltech's Environmental Quality Laboratory.